We claim:

1. A method of approximating a behavior of an integrated circuit, the method which comprises the steps of:

(a) applying a set of test patterns to a system for one of testing and simulating an integrated circuit;

(b) applying the set of test patterns to a neural network;

(c) comparing outputs of the system for one testing and simulating the integrated circuit and outputs of the neural network for providing a comparison result; and

(d) adapting parameters of the neural network to approximate a behavior of the integrated circuit based the comparison result.

2. The method according to claim 1, which comprises:

using, as the system for one of testing and simulating the integrated circuit, an automatic test equipment (ATE); and

applying the set of test patterns to the integrated circuit via the automatic test equipment.

3. The method according to claim 2, which comprises

implementing the neural network in the automatic test equipment.

4. The method according to claim 1, which comprises generating the set of test patterns on a random basis.

5. The method according to claim 1, wherein step (d) includes adapting inter-unit weights of the neural network through back-propagation.

6. The method according to claim 1, which comprises repeating steps (a) to (d) until a level of adaptation in step (d) falls below a given value.

7. The method according to claim 5, which comprises storing data representing predetermined neural network parameters after terminating a repetition of steps (a) to (d).

8. A method of selecting test patterns, the method which comprises the steps of:

(a) approximating a behavior of an integrated circuit by applying a set of test patterns to a system for one of testing and simulating the integrated circuit, applying the set of test patterns to a neural network, comparing outputs of the system for one testing and simulating the integrated circuit

and outputs of the neural network for providing a comparison result, and adapting parameters of the neural network in order to approximate the behavior of the integrated circuit based the comparison result;

(b) applying a test pattern to the neural network whose parameters have been adapted to approximate the behavior of the integrated circuit in accordance with step (a);

(c) processing an output of the neural network to determine whether given criteria are met; and

(d) selecting the test pattern for storage if the given criteria are met.

9. The method according to claim 8, which comprises repeating steps (b) to (d) until a given number of test patterns have been stored.

10. The method according to claim 8, which comprises concluding that the given criteria are met if a value of a given parameter of a signal output by the neural network in response to applying the test pattern exceeds a reference value.

11. The method according to claim 10, which comprises:

(e) applying a further set of test patterns to the integrated circuit by using an automatic test equipment;

(f) measuring values of the given parameter of output signals generated by the integrated circuit in response to step (e); and

(g) concluding that the given criteria are met if the value of the given parameter of the signal output by the neural network in response to applying a test pattern exceeds the reference value and all values measured in step (f).

12. The method according to claim 11, which comprises generating the further set of test patterns on a random basis.

13. The method according to claim 10, which comprises using a dynamic current as the given parameter.

14. The method according to claim 8, which further comprises:

(h) generating a test pattern population formed of a plurality of test patterns;

(i) applying each test pattern of the test pattern population to the neural network;

(j) processing, for each test pattern, the output of the neural network to determine a value of a given parameter; and

(k) allocating each test pattern to one of a plurality of classification groups in accordance with the value of the given parameter determined in step (j).

15. The method according to claim 14, which comprises repeating steps (h) to (k) using a new test pattern population formed of test patterns included in a selected one of the classification groups.

16. The method according to claim 15, which comprises using, as the selected one of the classification groups, test patterns that approximate a set of worst case input parameters of operation of the integrated circuit.

17. The method according to claim 8, which comprises:

repeating steps (b) to (d) a number of times;

applying the test patterns selected in each step (d) to a simulator for simulating the integrated circuit;

processing an output of the simulator to determine whether

further given criteria are met; and

selecting for storage those test patterns that meet the further given criteria.

18. The method according to claim 8, which comprises:

repeating steps (b) to (d) a number of times;

applying test patterns selected in each repetition of step (d) to the integrated circuit by using an automatic test equipment;

processing an output of the automatic test equipment to determine whether further given criteria are met; and

selecting for storage those test patterns which meet the further given criteria.

19. The method according to claim 8, which comprises using, as the given criteria, a representation of an approximation of a worst case mode of operation of the integrated circuit.

20. A method of simulating an integrated circuit, the method which comprises the steps of:

selecting test patterns by, in a first step, applying a test pattern to a neural network whose parameters have been adapted to approximate a behavior of an integrated circuit by applying a set of test patterns to a system for one of testing and simulating the integrated circuit, applying the set of test patterns to a neural network, and comparing outputs of the system for one of testing and simulating the integrated circuit and outputs of the neural network, and, in a second step, processing an output of the neural network to determine whether given criteria are met and selecting a test pattern if the given criteria are met; and

applying test patterns that have been selected to a simulator for simulating the integrated circuit.

21. A method of testing an integrated circuit, the method which comprises the steps of:

selecting test patterns by, in a first step, applying a test pattern to a neural network whose parameters have been adapted to approximate a behavior of an integrated circuit by applying a set of test patterns to a system for one of testing and simulating the integrated circuit, applying the set of test patterns to a neural network, and comparing outputs of the system for one of testing and simulating the integrated circuit and outputs of the neural network, and, in a second

step, processing an output of the neural network to determine whether given criteria are met and selecting a test pattern if the given criteria are met; and

applying test patterns that have been selected to the integrated circuit by using an automatic test equipment.

22. A method of providing a test pattern for one of a simulation and a test of a layout of an integrated circuit, the method which comprises the steps of:

(A) providing a set of test patterns that have been selected by, in a first step, applying a test pattern to a neural network whose parameters have been adapted to approximate a behavior of an integrated circuit by applying a set of test patterns to a system for one of testing and simulating an integrated circuit, applying the set of test patterns to a neural network, and comparing outputs of the system for one of testing and simulating the integrated circuit and outputs of the neural network, and, in a second step, processing an output of the neural network to determine whether given criteria are met and selecting a test pattern if the given criteria are met; and

(B) applying the set of test patterns to the integrated circuit by using an automatic test equipment (ATE);

(C) determining outputs of the integrated circuit;

(D) processing the outputs to determine whether given test criteria are met; and

(E) depending on a determination in step (D), generating a new set of test patterns based on the set of test patterns provided by step (A) by using a genetic algorithm.

23. The method according to claim 22, which comprising repeating steps (B) to (E) until the given test criteria are met.

24. The method according to claim 22, which comprises repeating steps (B) to (E) until a condition is met, the condition being selected from the group consisting of meeting the given test criteria and repeating steps (B) to (E) a given number of times.

25. The method according to claim 22, which comprises concluding that the given test criteria are met if the set of test patterns is associated with an average fitness above a given value.

26. The method according to claim 22, wherein step (E)

includes combining at least some of the test patterns according to the genetic algorithm in order to provide the new set of test patterns.

27. The method according to claim 26, which further comprises:

selecting test patterns from the set of test patterns according to given selection criteria in order to provide selected test patterns; and

combining the selected test patterns according to the genetic algorithm to provide the new set of test patterns.

28. The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a fitness value greater than a reference value.

29. The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns.

30. The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns, and repeating the selecting step until a given percentage of

test patterns has been selected.

31. The method according to claim 29, wherein step (E) includes:

(F) sorting selected test patterns according to an order of associated fitness values;

(G) randomly selecting parent test patterns from test patterns as sorted in step (F); and

(H) combining selected ones of the parent test patterns.

32. The method according to claim 22, which comprises using at least one element selected from the group consisting a mutation, a crossing over, and a re-combination for the genetic algorithm.

33. The method according to claim 22, wherein the step (A) includes providing a plurality of sets of test patterns such that each of the sets of test patterns is included in a test pattern population.

34. The method according to claim 22, which comprises providing a plurality of test pattern populations and performing steps (B) to (E) for each of the test pattern

populations.

35. A data processing configuration, comprising:

a system for one of testing and simulating an integrated circuit, said system being configured to be supplied with a set of test patterns;

a neural network operatively connected to said system for one of testing and simulating the integrated circuit, said neural network being configured to be provided with the set of test patterns;

a comparison unit operatively connected to said neural network and said system for one of testing and simulating the integrated circuit, said comparison unit being configured to compare outputs from said system for one of testing and simulating the integrated circuit and from said neural network in order to provide a comparison result; and

an adapting unit operatively connected to said comparison unit, said adapting unit being configured to adapt parameters of said neural network in order to approximate a behavior of the integrated circuit based the comparison result.

36. A computer-readable medium having computer-executable

instructions for performing a method which comprises the steps of:

applying a set of test patterns to a system for one of testing and simulating an integrated circuit;

applying the set of test patterns to a neural network;

comparing outputs of the system for one of testing and simulating the integrated circuit and outputs of the neural network for providing a comparison result; and

adapting parameters of the neural network to approximate a behavior of the integrated circuit based the comparison result.